Icarus

INTERNATIONAL JOURNAL OF SOLAR SYSTEM STUDIES

Volume 42 • 1980

EDITOR: *Joseph A. Burns*
Space Science Building
Cornell University
Ithaca, New York 14853

ACADEMIC PRESS
A Subsidiary of Harcourt Brace Jovanovich, Publishers
New York London Toronto Sydney San Francisco

Copyright © 1980 by Academic Press, Inc.

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (21 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 or the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1979 articles are the same as those shown for current articles.

MADE IN THE UNITED STATES OF AMERICA

CONTENTS OF VOLUME 42

NUMBER 1, APRIL 1980

MARK SETTLE. The Role of Fallback Ejecta in the Modification of Impact Craters 1
GARRETT W. BRASS. Stability of Brines on Mars 20
MARK J. LUPO AND JOHN S. LEWIS. Mass–Radius Relationships and Constraints on the Composition of Pluto 29
WILLIAM HERBST AND R. SUNDAR RAJAN. On the Role of a Supernova in the Formation of the Solar System 35
R. P. BINZEL AND A. W. HARRIS. Photoelectric Lightcurves of Asteroid 18 Melpomene 43
JEAN-PAUL PARISOT AND GUY MOREELS. Oxygen 1.27-μm Emission from the Atmosphere of Venus 45
P. D. NICHOLSON AND T. J. JONES. Two-Micron Spectrophotometry of Uranus and Its Rings 54
W. W. MACY, JR., W. M. SINTON, AND C. A. BEICHMAN. Five-Micrometer Measurements of Uranus and Neptune 68
MICHAEL J. S. BELTON, L. WALLACE, SETHANNE H. HAYES, AND MICHAEL J. PRICE. Neptune's Rotation Period: A Correction and a Speculation on the Difference between Photometric and Spectroscopic Results 71
A. T. TOKUNAGA, H. L. DINERSTEIN, D. F. LESTER, AND D. M. RANK. The Phosphine Abundance on Saturn Derived from New 10-Micrometer Spectra 79
W. M. SINTON, W. W. MACY, AND G. S. ORTON. Infrared Scans of Jupiter 86
WILLIAM HAYDEN SMITH, WILLIAM MACY, AND WILLIAM COCHRAN. Ammonia in the Atmospheres of Saturn and Jupiter 93
WILLIAM D. COCHRAN AND ANITA L. COCHRAN. Longitudinal Variability of Methane and Ammonia bands on Jupiter 102
L. TRAFTON. The Jovian SII Torus: Its Longitudinal Asymmetry 111
F. PETER SCHLOERB, DUANE O. MUHLEMAN, AND GLENN L. BERGE. Interferometry of Saturn and Its Rings at 1.30-cm Wavelength 125
J. TARTER, J. CUZZI, D. BLACK, AND T. CLARK. A High-Sensitivity Search for Extraterrestrial Intelligence at λ 18 cm 136
D. W. DAVIES. Direct Imaging of Planetary Systems around Nearby Stars 145
DANIEL P. WHITMIRE AND DAVID P. WRIGHT. Nuclear Waste Spectrum as Evidence of Technological Extraterrestrial Civilizations 149
BOOK REVIEWS 157

NUMBER 2, MAY 1980

GERALD G. SCHABER. Radar, Visual and Thermal Characteristics of Mars: Rough Planar Surfaces 159
JAMES C. PECHMANN. The Origin of Polygonal Troughs on the Northern Plains of Mars 185
QUINN R. PASSEY AND H. J. MELOSH. Effects of Atmospheric Breakup on Crater Field Formation 211
P. THOMAS AND J. VEVERKA. Downslope Movement of Material on Deimos 234
W. M. SINTON, W. W. MACY, J. GOOD, AND G. S. ORTON. Infrared Scans of Saturn 251

MALCOLM B. NIEDNER, JR. AND JOHN C. BRANDT. Structures Far from the Head of Comet Kohoutek. II. A Discussion of the Swan Cloud of January 11 and of the General Morphology of Cometary Plasma Tails 257
F. A. FRANKLIN, M. LECAR, D. N. C. LIN, AND J. PAPALOIZOU. Tidal Torques on Infrequently Colliding Particle Disks in Binary Systems and the Truncation of the Asteroid Belt 271
BOOK REVIEWS
CLARK R. CHAPMAN. *The Realm of the Terrestrial Planets,* Zdeněk Kopal ... 281
GERALD S. HAWKINS. *Astronomy of the Ancients,* Kenneth Brecher and Michael Feirtag, Eds. 282
JOSEPH A. BURNS. *Natural and Artificial Satellite Motion,* P. E. Nacozy and S. Ferraz-Mello, Eds. 283
JOSEPH A. BURNS. *Dynamics of the Solar System,* R. L. Duncombe, Ed. 283
ERRATUM
Volume 41, Number 2, February 1980: George Gatewood, Lee Breakiron, Ronald Goebel, Steven Kipp, Jane Russell, and John Stein, "On the Astrometric Detection of Neighboring Planetary Systems, II," pp. 205–231 285

NUMBER 3, JUNE 1980

L. E. ROTH, G. S. DOWNS, R. S. SAUNDERS, AND G. SCHUBERT. Radar Altimetry of South Tharsis, Mars 287
PAUL D. KOMAR. Modes of Sediment Transport in Channelized Water Flows with Ramifications to the Erosion of the Martian Outflow Channels 317
JOHN S. LEWIS AND FRANK A. KREIMENDAHL. Oxidation State of the Atmosphere and Crust of Venus from Pioneer Venus Results 330
A. BAR-NUN. Production of Nitrogen and Carbon Species by Thunderstorms on Venus 338
D. CHRIS BENNER AND UWE FINK. Application of Methane Band-model Parameters to the Visible and Near-Infrared Spectrum of Uranus 343
V. M. KLIMENKO, A. V. MOROZHENKO, AND A. P. VID'MACHENKO. Phase Effect for the Brightness Coefficient of the Central Disk of Saturn and Features of Jupiter's Disk 354
ALLEN S. GROSSMAN, JAMES B. POLLACK, RAY T. REYNOLDS, AUDREY L. SUMMERS, AND HAROLD C. GRABOSKE, JR. The Effect of Dense Cores on the Structure and Evolution of Jupiter and Saturn 358
ELMAR K. JESSBERGER, BOGNA DOMINIK, THOMAS STAUDACHER, AND GREGORY F. HERZOG. ^{40}Ar–^{39}Ar Ages of Allende 380
JULIO A. FERNÁNDEZ. Evolution of Comet Orbits under the Perturbing Influence of the Giant Planets and Nearby Stars 406
A. R. DOBROVOLSKIS AND JOSEPH A. BURNS. Life near the Roche Limit: Behavior of Ejecta from Satellites Close to Planets 422
ROBERT A. FREITAS, JR. AND FRANCISCO VALDES. A Search for Natural or Artificial Objects Located at the Earth–Moon Libration Points 442
BOOK REVIEWS
A. H. DELSEMME. *The Origin of the Solar System,* S. F. Dermott, Ed. 448
DONALD E. GAULT, *Astroblemes-Cryptoexplosion Structures,* G. J. H. McCall, Ed. 450

Announcements 452
Author Index for Volume 42 453

The Subject Index for Volume 42 will appear in the December 1980 issue as part of a cumulative index for the year 1980.